

In re Appln. of Gridley et al.
Application No. 09/492,602

AMENDMENTS

IN THE CLAIMS

Please amend claims 23 and 50, as indicated below in the listing of claims.

Listing of Claims

C1 514 D7
Claims 1-22 (Canceled).

23. (Currently Thrice Amended) A method of retreading tires, comprising:
mounting a tire casing on a hub, the hub being rotatable;
applying a length of unheated cushion gum substantially without cement
around the circumference of the tire casing, said cushion gum being dispensed at a
linear velocity that is less than the tangential velocity of the periphery of said tire
casing such that the cushion gum adheres to said tire casing as a result of stretching of
the length of cushion gum being controlled during application;
measuring, automatically, the circumference of the tire casing and cushion
gum;
dispensing, automatically, along a track a length of tire tread based on the
measured circumference of the tire casing and cushion gum, the length of tread having
a first end;
adjusting the length of said tire tread along the track relative to a tread cutter
so that, after being cut, the first end and a second end of the tire tread will provide a
substantially continuous tread design when brought together on the casing;
cutting said length of tire tread to define the second end;
moving the cut length of tire tread along the track to provide the cut length of
tire tread to the tire casing and cushion gum;
applying the cut length of tire tread to the tire casing and cushion gum; and
controlling the pressure applied to the tire tread during application, the
pressure applied to the tread based on the circumferential distance of the casing and
the cushion gum not covered by the tire tread and the length of tire tread not applied
to the casing and the cushion gum;
wherein the cushion gum applying, measuring, dispensing, adjusting, cutting,
tire tread applying, and controlling are performed on an integrated machine.

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C/SUBD/24. (Previously Presented) The method of claim 23, wherein the measuring step includes measuring the circumference of the tire casing before the cushion gum is applied to the tire casing and after the cushion gum is applied to the tire casing.

25. (Original) The method of claim 24, further comprising:
rotating the hub at an angular rate based on the circumference of the tire casing.

26. (Original) The method of claim 23, further comprising:
cutting the tire tread to an automatically determined length.

27. (Original) The method of claim 23, further comprising:
cutting the tire tread to an operator determined length.

Claims 28 and 29 (Canceled).

30. (Previously Presented) The method of claim 23 further comprising:
stitching the cushion gum to the tire casing.

31. (Previously Presented) The method of claim 23 further comprising:
dispensing cushion gum at a rate dependent upon a tangential velocity of the periphery of said tire casing

32. (Previously Presented) The method of claim 23 further comprising:
monitoring the circumferential distance of the casing and the cushion gum not covered by the tire tread; and
monitoring the length of tire tread not applied to the casing and the cushion gum.

33. (Previously Presented) The method of claim 23 further comprising:
stitching the tire tread to the casing and the cushion gum.

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34. (Previously Presented) The method of claim 33 wherein monitoring the circumferential distance of the casing and the cushion gum not covered by the tire tread occurs substantially continuously and monitoring the length of the tread not applied to the casing and the cushion gum occurs substantially continuously.

Claims 35-39 (Withdrawn).

40. (Previously Presented) An apparatus for retreading tires, comprising:
a rotatable hub for mounting a tire casing, the tire casing having a periphery;
a drive adapted to rotate the hub and casing combination to develop a tangential velocity at the periphery of the casing;
a cementless cushion gum applicator adapted to stretch a length of cushion gum onto the tire casing, the stretch being controlled during application relative to the tangential velocity of the periphery of the tire casing such that the stretched cushion gum substantially adheres to the tire casing;
a tread cutter for cutting a length of tire tread, the length of tire tread having a first end;
a tread dispenser adapted to automatically dispense the length of tire tread based on the circumference of at least one of the tire casing and the tire casing plus the cushion gum, said tread dispenser includes a tread drive adapted to permit the location of the length of tire tread to be adjustable with respect to the tread cutter for cutting the tire tread to define a second end in such a manner that, once the cut tread is applied, the design pattern of the tire tread will appear substantially continuous; and
a tread applicator adapted to apply the length of tire tread onto the cushion gum;
wherein the cushion gum applicator, the tread dispenser, the tread cutter, and the tread applicator are integrated into a single machine.

41. (Previously Presented) The apparatus of claim 40 further comprising:
a measuring device adapted to measure the circumference of the tire casing.

42. (Previously Presented) The apparatus of claim 40 further comprising:
a measuring device adapted to measure the circumference of at least one of the circumference of the tire casing and the circumference of the tire casing plus the cushion gum.

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43. (Previously Presented) The apparatus of claim 40 wherein the drive is adapted to rotate the hub and casing combination at an angular rate based on the circumference of the tire casing.

44. (Previously Presented) The apparatus of claim 40 further comprising:
a rotatable spindle for mounting a roll of cushion gum thereon and dispensing a length of cushion gum therefrom.

45. (Previously Presented) The apparatus of claim 44 wherein the drive is adapted to rotate the hub and casing combination at an angular rate based on the circumference of the tire casing, wherein the drive is adapted to rotate the hub and casing combination at a first angular rate, the spindle at a second angular rate, and wherein the second angular rate is based on the first angular rate.

46. (Previously Presented) The apparatus of claim 45 wherein the drive is adapted to rotate the hub and casing combination such that a point on the perimeter of the tire casing has a first tangential velocity, a point on the perimeter of the roll has a second tangential velocity, and wherein the first tangential velocity minus the second tangential velocity provide a nonnegative differential velocity.

47. (Previously Presented) The apparatus of claim 46 wherein the drive is adapted such that the differential velocity is substantially constant during application of the cushion gum.

48. (Previously Presented) The apparatus of claim 40 further comprising:
a set of stitching rollers adapted to engage the cushion gum and provide pressure on the cushion gum as the tire casing is rotated, thereby providing enhanced adhesion of the cushion gum to the tire casing.

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50. (Currently Twice Amended) An apparatus for retreading tires, comprising:
a rotatable hub for mounting a tire casing, the tire casing having a periphery;
a cushion gum applicator adapted to apply a length of unheated cushion gum
onto the tire casing, wherein said applicator dispenses said cushion gum at a rate
which is less than the tangential velocity of the periphery of said tire casing to thereby
stretch said cushion gum onto said tire casing;
a tread dispenser adapted to automatically dispense a length of tire tread based
on the circumference of at least one of the tire casing and the tire casing plus the
cushion gum;
a tread cutter for cutting the tread to define the length of tread such that the
length of tread has a first end and a second end;
a track adapted to receive the length of tread from the tread dispenser and to
provide the cut length of tire tread to the casing; and
a variable force tread applicator adapted to apply the length of tire tread onto
the casing with the cushion gum disposed therebetween, wherein the variable force
applicator is adapted to apply the tread to the casing with a variably controlled force
that is based on the circumferential distance of the casing and cushion gum not yet
covered by the tire tread and the length of tire tread not yet applied to the casing and
cushion gum;
wherein the cushion gum applicator, the tread dispenser, the track, and the
variable force tread applicator are integrated into a single machine.

Claims 51-53 (Withdrawn).

54. (Previously Presented) The apparatus of claim 50 wherein the variable force
tread applicator is adapted to stretch the tire tread onto the casing such that when the tire tread
has been applied to the casing, the first end and the second end define a gap therebetween, the
gap being within a predetermined range of distances.

55. (Previously Presented) The apparatus of claim 50 wherein the variable force
tread applicator includes an applicator roller, the applicator roller movable in a direction
substantially normal to the circumference of the tire casing to apply a variably controlled force
to the tire casing.

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56. (Previously Presented) The apparatus of claim 50 wherein the cushion gum applicator and the tread dispense are disposed such that the cushion gum and the tire tread are substantially aligned, and the hub is adjustable laterally in the direction of the axis of rotation of the hub to align the casing with the cushion gum and the tire tread.

57. (Previously Presented) The apparatus of claim 50 further comprising:
a measuring device, the measuring device adapted to measure at least one of the circumference of the tire casing and the circumference of the tire casing plus cushion gum.